AMENDMENTS TO THE SPECIFICATION

Please replace paragraph bridging pages 4 and 5 with the following rewritten paragraph:

[0013] To achieve the above objectives, according to one aspect of the present invention, in a drive circuit of a direct-current voltage-driven magnetic contactor including an operating coil that is capable of a direct-current excitation, a main contact that is in an open circuit condition in an attracting period of an initial period of excitation by the operating coil and is in a closed circuit condition in the following holding period, and an auxiliary contact that carries out a reverse opening and closing operation from the main contact is connected to a positive electrode side of the exciting direct-current power supply and the other end of the same is connected to one end of the auxiliary contact, the drive circuit includes a starting semiconductor switching element provided between the other end of the auxiliary contact and a negative electrode side of the exciting direct-current power supply; a direct-current power supply voltage detecting circuit~~direct-current voltage detecting circuit~~ that outputs a start instruction signal when an applied voltage of the exciting direct-current power supply has exceeded a predetermined value; a driving direct-current power supply whose negative electrode side is connected to the negative electrode side of the exciting direct-current power supply; a first drive circuit that makes the starting semiconductor switching element perform an ON operation upon receiving the start instruction signal, using the driving direct-current power supply as an operating power supply; a charging capacitor whose one end is connected to a positive electrode side of the driving direct-current power supply via a diode and whose other end is connected to the other end of the auxiliary contact; a current limiting semiconductor switching element connected in parallel to the

auxiliary contact; and a second drive circuit that makes the current limiting semiconductor switching element perform a switching operation when a terminal voltage of the charging capacitor has reached a predetermined value.

Please replace the first full paragraph on page 8 with the following rewritten paragraph:

EXPLANATIONS OF LETTERS OR NUMERALS

[0017] 1 Exciting direct-current power supply

2 Free-wheeling diode

3 Operating coil

4 Main contact

5 Auxiliary contact

6 Current limiting semiconductor switching element

7 Current detecting shunt resistor

8 Resistor

9 Capacitor

10 Drive circuit of a current limiting semiconductor switching element

11 Charging capacitor

12 Charging current limiting resistor

13 Rectifying diode

14 Resistor

15 Starting semiconductor switching element

16 Drive circuit of a starting semiconductor switching element

17 Driving direct-current power supply~~Direct-current power supply for a drive circuit~~

18 Exciting direct-current power supply voltage detecting circuit

31 Three-phase alternating-current power supply

32 Rectifier circuit

34 Smoothing capacitor

35 Switching circuit

36 Electric motor

37 Inrush current suppression circuit

38 Inrush current suppression resistor

Please replace the first full paragraph on page 9 with the following rewritten paragraph:

[0019] ~~First Embodiment~~

Fig. 1 is a circuit diagram of a drive circuit in a direct-current voltage-driven magnetic contactor according to a first embodiment of the present invention. In Fig. 1, the direct-current voltage-driven magnetic contactor is provided with an operating coil 3 capable of a direct-current excitation, a main contact 4 that is in an open circuit condition in an attracting period of an initial period of excitation by this operating coil 3 and is in a closed circuit condition in the following holding period, and an auxiliary contact 5, a so-called b-contact, that carries out an opening and closing operation reverse of the main contact 4. Hereinafter, the direct-current voltage-driven magnetic contactor will be simply abbreviated to MC unless it is necessary to make a distinction.

Please replace paragraph bridging pages 12 and 13 with the following rewritten paragraph:

[0029] When the charging capacitor 11 is completely charged, the drive circuit 10 uses the charged voltage as a starting power supply to give a drive instruction (on/off control signal)

to the current limiting semiconductor switching element 6 so that the current limiting semiconductor switching element 6 is switched at a preset frequency and starts a switching operation. Herein, the drive circuit 10 generates a drive instruction (on/off control signal) without using a circuit of the current detecting shunt resistor 7~~the current limiting shunt resistor 7~~, the resistor 8, and the capacitor 9.

Please replace the first full paragraph on page 13 with the following rewritten paragraph:

[0030] Then, when a sufficient attraction current flows to the operating coil 3 and attraction of the main contact 4 is completed, the main contact 4 is in a closed circuit condition, and the auxiliary contact 5 is simultaneously in an open circuit condition. Therefore, the current path that flows to the operating coil 3 changes, as shown in Fig. 4, to a holding current path C from the positive electrode end P of the exciting direct-current power supply 1, the operating coil 3, the current limiting semiconductor switching element 6, the current detecting shunt resistor 7~~the current limiting shunt resistor 7~~, and the starting semiconductor switching element 15, to the negative electrode end N of the exciting direct-current power supply 1, and a holding current for holding the main contact 4 flows.

Please replace paragraph bridging pages 15 and 16 with the following rewritten paragraph:

In other words, in the conventional system for switching over an attracting condition and a holding condition by controlling an ON-time width~~ON- width~~ of the semiconductor switching element, although the drive circuit has been complicated to switch over the attracting condition and holding condition, this problem can be solved.

Please replace the fourth paragraph on page 16 with the following rewritten paragraph:

[0042] In addition, since a switchover between an attracting condition and a holding condition can be designed by only a charging time constant determined by the charging capacitor 11 being a driving power supply for the current limiting circuit and the charging current limiting resistor 12~~the charging current suppressing resistor 12~~ and an operation time of the auxiliary contact 5, it becomes possible to simplify the MC drive circuit based on this point as well.

Please replace the first full paragraph on page 17 with the following rewritten paragraph:

[0044] ~~Second Embodiment~~

Fig. 6 is a time chart for explaining a stabilizing control operation of a holding current carried out in a drive circuit of a direct-current voltage-driven magnetic contactor according to a second embodiment of the present invention. A stabilizing control operation of a holding current that is carried out by the drive circuit 10 at the time of holding current control operation explained in the first embodiment, using the current detecting shunt resistor 7~~the current limiting shunt resistor 7~~, will be explained in the second embodiment with respect to the

configuration shown in Fig. 1. Here, the low-pass filter composed of the resistor 8 and the capacitor 9 is provided, since an exciting current that flows to the operating coil is a chopper-controlled minute current, to securely extract a DC component of the same.

Please replace the first full paragraph on page 19 with the following rewritten paragraph:

[0049] As such, according to the second embodiment, a holding current is reduced by shortening the ON-time width of the current limiting semiconductor switching element when the exciting direct-current power supply voltage is high ~~in voltage~~ and the holding current is large, and a preset ON-time width is used without changing the ON-time width of the current limiting semiconductor switching element when the exciting direct-current power supply voltage is low and the holding current is less. Therefore, it becomes possible to prevent a thermal destruction of the current limiting semiconductor switching element and wire breaking of the operating coil concerned due to an increase in the ON-time width.

Please replace the fourth paragraph on page 19 with the following rewritten paragraph:

[0052] ~~Third Embodiment~~

Fig. 7 is a circuit diagram of a power converter according to a third embodiment of the present invention.

Please replace the first full paragraph on page 20 with the following rewritten paragraph:

[0053] In Fig. 7, the power converter is provided with a rectifying circuit 32 of a diode-bridge configuration that forward-converts an alternating-current power inputted from a three-phase alternating-current power supply 31 to a direct-current power, a smoothing capacitor 34 that smoothes the direct-current power forward-converted by the rectifying circuit 32 and holds the same as a direct-current bus voltage ~~33~~, a switching circuit 35 that inverse-converts the direct-current bus voltage ~~33~~, being a terminal voltage of the smoothing capacitor 34, to an alternating-current by switching the direct-current bus voltage using semiconductor switching elements, and an inrush current suppression circuit 37 provided between the rectifying circuit 32 and smoothing capacitor 34.

Please replace the second paragraph on page 20 with the following rewritten paragraph:

[0054] The switching circuit 35 includes three sets of two semiconductor switching elements connected in series between a positive electrode side P and a negative electrode side N of the direct-current bus voltage ~~33~~ and free-wheeling diodes connected in parallel to the respective semiconductor switching elements, and an electric motor 36 is connected to the three-phase output end composed of three connection ends of the two semiconductor switching elements connected in series.

Please replace the first full paragraph on page 21 with the following rewritten paragraph:

[0056] Herein, the incorporated drive circuit shown in the first embodiment and second embodiment is structured to operate using the direct-current bus voltage ~~33~~, being a terminal voltage of the smoothing capacitor 34, as the exciting direct-current power supply 1. This is because, as explained in the first embodiment, because an exciting current to the operating coil 3 is supplied by chopper control, the drive circuit operates without problem even if there is a slight fluctuation in the exciting direct-current power supply 1.

Please replace the first full paragraph on page 22 with the following rewritten paragraph:

[0059] While carrying out the stabilizing control operation of a holding current shown in Fig. 6 by detecting a decline in voltage of the current detecting shunt resistor 7 via the low-pass filter composed of the resistor 8 and the capacitor 9, the drive circuit 10 extracts a DC component with accuracy from a minute current that flows to the operating coil and judges presence of excess current. Thus, a fixed holding current can flow accurately irrespective of a fluctuation in voltage of the exciting direct-current power supply ~~the direct-current bus voltage 1~~.

Please delete the present Abstract of the Disclosure.

Please add the following new Abstract of the Disclosure:

In a direct-current voltage-driven magnetic contactor, a main contact is in an open circuit condition in an attraction period of an initial period of excitation by an operating coil, and in a closed circuit condition in a subsequent holding period, and a drive circuit includes a direct-current power supply voltage detecting circuit that gives a start signal when an applied voltage of a exciting direct-current power supply exceeds a predetermined value, a first drive circuit that makes a starting semiconductor switching element perform an ON operation on receiving the start signal, and a second drive circuit that makes a current limiting semiconductor switching element perform a switching operation when a terminal voltage of a charging capacitor reaches the predetermined value.